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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/441,140	11/16/1999	BEKA SOLOMON	SOLOMON1REI	3910

1444 7590 08/06/2012

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EXAMINER	
BALLARD, KIMBERLY	
ART UNIT	PAPER NUMBER
1649	

MAIL DATE	DELIVERY MODE
08/06/2012	PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BEKA SOLOMON

Appeal 2012-004898
Application 09/441,140
Technology Center 1600

Before DONALD E. ADAMS, DEMETRA J. MILLS, and
JEFFREY N. FREDMAN, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to an antibody composition which binds beta-amyloid and inhibits beta amyloid aggregation. The Examiner rejected the claims as obvious, as claiming new matter and as failing to satisfy the written description requirement. We have jurisdiction under 35 U.S.C. § 6(b). We affirm-in-part.

Statement of the Case

Background

"Aggregated amyloid β-protein (βA4) is a major constituent of the abnormal extracellular amyloid plaque that characterizes the brains of victims of Alzheimer's disease (AD)" (Spec. col. 3, ll. 8-10). The Specification teaches that "a method is provided of selecting anti-aggregation molecule such as a monoclonal antibody" (Spec. col. 3, ll. 42-43).

The Claims

Claims 177, 210-223, and 225-227 are on appeal. Claim 210 is representative and reads as follows:

> 210. A therapeutic composition, comprising: a pharmaceutical formulation comprising
> (1) a pharmaceutically acceptable carrier and
> (2) (a) a genetically-engineered antibody that binds beta-amyloid and inhibits aggregation of beta-amyloid or maintains the solubility of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33, or
> (b) a fragment of the genetically-engineered antibody of (a) that binds beta-amyloid and inhibits aggregation of beta-amyloid or maintains the solubility of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33,
> wherein said genetically-engineered antibody is obtained by genetically engineering the DNA encoding a monoclonal antibody that
> (i) binds beta-amyloid and inhibits aggregation of beta-amyloid or maintains the solubility of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33, and
> (ii) is obtainable using an immunogen consisting of a peptide consisting of residues 1-28 of beta-amyloid; and
> wherein said antibody or fragment is not conjugated with a detectable moiety.

The issues

A. The Examiner rejected claims 177 and 210-218 under 35 U.S.C. § 112, first paragraph, new matter, as failing to satisfy the written description requirement (Ans. 5-7).

B. The Examiner rejected claims 177, 210-213, and 215-217 under 35 U.S.C. § 103(a) as obvious over Bickel,[1] Solomon,[2,3] Becker,[4] and Ladner[5] (Ans. 12-18).

C. The Examiner rejected claims 177, 210-213, 215-217, 219-223, and 225-227 under 35 U.S.C. § 103(a) as obvious over Walker,[6] Hanan,[7] Bacskai,[8] and Becker (Ans. 18-23).

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[1] Bickel et al., *Development an in Vitro Characterization of a Cationized Monoclonal Antibody against βA4 Protein: A Potential Probe for Alzheimer's Disease*, 5 BIOCONJUGATE CHEM. 119-125 (1994).

[2] Beka Solomon, *Immunological approaches as therapy for Alzheimer's disease*, 2 EXPERT OPIN. BIOL. THER. 907-917 (2002).

[3] The Examiner's statement of rejection and evidence relied upon identify two different Solomon references. In reviewing this rejection, we rely upon the Solomon reference in the statement of rejection, cited in note 2 above.

[4] Becker et al., EP 0 613 007 A2, published Aug. 31, 1994.

[5] Ladner et al., US 4,946,778, issued Aug. 7, 1990.

[6] Walker et al., *Labelling of Cerebral Amyloid In Vivo with a Monoclonal Antibody*, 53 J. NEUROPATHOLOGY AND EXPERIMENTAL NEUROLOGY 377-383 (1994).

[7] Eilat Hanan and Beka Solomon, *Inhibitory effect of monoclonal antibodies on Alzheimer's β-amyloid peptide aggregation*, 3 INT. J. EXP. CLIN. INVEST. 130-133 (1996).

[8] Bacskai et al. *Imaging of amyloid-β deposits in brains of living mice permits direct observation of clearance of plaques with immunotherapy*, 7 NATURE MEDICINE 369-372 (2001).

D. The Examiner rejected claims 177 and 210-218 under 35 U.S.C. § 112, first paragraph, as failing to satisfy the written description requirement (Ans. 7-11).

A. 35 U.S.C. § 112, first paragraph, new matter

The Examiner finds that there "is no *verbatim* support in the specification as originally filed for anti-β-amyloid antibodies which inhibit aggregation of β-amyloid to a particular specified degree, nor does this language flow naturally from the disclosure as originally filed" (Ans. 6). The Examiner finds that the "specification as filed thus does not support the genus of antibodies that is described in terms of meeting or exceeding the ability of the antibody AMY-33 to inhibit β-amyloid aggregation" (*id.*).

Appellant contends that the "concept of the use of any antibody that binds to [β-amyloid] and prevents aggregation is present in the present specification as filed, for example, at column 16, line 21-26" (App. Br. 15). Appellant contends that "no one of ordinary skill in the art would have considered that, once one raises and tests other antibodies for these properties, other antibodies having properties even better than those shown in the assay of Figure 7A might be found" (*id.* at 15-16).

The issue with respect to this rejection is: Does the evidence of record support the Examiner's finding that the limitation requiring the antibody to maintain "the solubility of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33" in claim 210 represents new matter?

Findings of Fact

1. The Specification teaches that "the formation of the immuno-complexes with selected, highly specific monoclonal antibodies, should provide a general and convenient method to prevent aggregation of the proteins without affecting their biological properties" (Spec. col. 16, ll. 17-21).

2. The Specification teaches in a "preferred embodiment the human monoclonal antibody that binds to an aggregating protein and which prevents aggregation is utilized. In a further preferred embodiment the monoclonal antibody is an anti-β-amyloid and is designated AMY-33 which recognizes amino acids 1-28 of β-amyloid" (Spec. col. 6, ll. 21-26).

3. The Specification teaches, in Example 2, that "[b]inding of mAb AMY-33 to βA4 prevents self-aggregation of the β-amyloid, probably by recognizing the sequence 25-28 located in the proposed aggregation fragment comprising the amino acids between 25-28" (Spec. col. 16, ll. 5-8).

Principles of Law

"[I]t is the specification itself that must demonstrate possession. And while the description requirement does not demand any particular form of disclosure, … or that the specification recite the claimed invention *in haec verba*, a description that merely renders the invention obvious does not satisfy the requirement" *Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010).

Analysis

While the Examiner is correct that the specific language of the claims was not disclosed *ipsis verbis* in the Specification (Ans. 6), *ipsis verbis* support is not required. *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1570 (Fed. Cir. 1996).

The Specification teaches that the antibody AMY-33 functions to prevent self-aggregation of β-amyloid (FF 3), and teaches that AMY-33 is preferred monoclonal antibody from the class of all monoclonal antibodies which bind aggregating proteins (FF 1-2).

We agree with Appellant that the person of ordinary skill, in reading the Specification, would have found the Specification demonstrating possession of monoclonal antibodies or fragments thereof which are generated by an immunogen that is amino acids 1-28 of β-amyloid. The ordinary artisan would also find that the Specification teaches that the monoclonal antibodies have an activity which effectively functions to prevent self-aggregation of β-amyloid, where the standard for determining that function is the known AMY-33 antibody disclosed by the Specification (FF 1-3). We therefore conclude that the claim limitation is supported by the Specification as filed.

Conclusion of Law

The evidence of record does not support the Examiner's finding that the limitation requiring the antibody to maintain "the solubility of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33" in claim 210 represents new matter.

B & C. 35 U.S.C. § 103(a) over Bickel, Solomon, Becker, and Ladner or over Walker, Hanan, Bacskai, and Becker

The Examiner finds it obvious "to genetically-engineer the monoclonal antibody taught by Bickel et al. to make a single-chain antibody, as taught by Becker and Ladner, with a reasonable expectation of success in producing a molecule with reduced immunogenicity, improved affinity and sensitivity, greater stability, and reduced cost of production compared to whole antibodies" (Ans. 17). The Examiner finds it obvious to make

> a human monoclonal anti-Aβ antibody, as taught by Becker, obtainable using a peptide consisting of residues 1-28 of Aβ because this was the immunogen used to produce the AMY-33 antibody and commonly known and used in the art at the time of filing, and Bickel demonstrates that this antibody binds specifically to brain amyloid deposits, thus evidencing the usefulness of antibodies obtained with this immunogen.

(*Id.*)

The Examiner also finds it obvious "to genetically engineer the 10D5 monoclonal antibody to create a less immunogenic antibody molecule, such as a single chain antibody, for use in therapeutic applications as taught by both Walker et al. and Becker et al" (*id.* at 22). The Examiner finds it obvious

> to make a human monoclonal anti-Aβ antibody, as taught by Becker, obtainable using a peptide consisting of residues 1-28 of Aβ because this was the immunogen used to produce the 10D5 antibody and commonly known and used in the art at the time of filing, and Walker demonstrates that this antibody binds specifically to brain amyloid deposits

(*id.*).

Appellant contends that the "the newly discovered fact that the naked antibody can inhibit aggregation of soluble β-amyloid and/or cause disaggregation of aggregated β-amyloid confers on the antibody a 'direct' therapeutic capacity which is far more significant than the mere diagnostic (binding) property" (Reply Br. 23). Appellant contends that "the results for the presently claimed genetically engineered antibodies are nonetheless unexpected and thereby rebut any *prima facie* case of obviousness, because the prior art was unaware that the known antibodies had these properties" (*id.* at 21).

Appellant contends that:

> Nobody reading Bickel or Walker would expect that the genetically engineered antibody (naked) or the genetically engineered antibody/therapeutic molecule conjugate that the examiner considers to be *prima facie* obvious would be able to disaggregate aggregated β-amyloid and/or inhibit aggregation of soluble β-amyloid. Thus, there is highly surprising physical evidence of record of the properties of the genetically engineered AMY-33 or 10D5 antibodies that the examiner considers obvious.

(*Id.* at 19.)

The issues with respect to this rejection are:

(i) Does the evidence of record support the Examiner's conclusion that Bickel, Solomon, Becker, and Ladner render claim 210 *prima facie* obvious?

(ii) Does the evidence of record support the Examiner's conclusion that Walker, Hanan, Bacskai and Becker render claim 210 *prima facie* obvious?

(iii) If so, has Appellant presented evidence of secondary considerations, that when weighed with the evidence of obviousness, is sufficient to support a conclusion of non-obviousness?

Findings of Fact

4. Bickel teaches the "mouse mAb, AMY33, was used, which has been raised against a synthetic peptide corresponding to the first 28 amino acids of the βA4 sequence. The specificity of this antibody for β-amyloid protein in neuritic and diffuse plaques and cerebrovascular deposits has previously been demonstrated" (Bickel 122, col. 2).

5. Bickel teaches that "[i]mmunocytochemistry on 5-µm paraffin sections of human AD brains were performed as described" (Bickel 121, col. 1).

6. Bickel teaches that "the 'humanization' of murine monoclonal antibodies prior to mAb cationization may facilitate the use of these proteins as neurodiagnostic or therapeutic agents in humans" (Bickel 124, col. 2).

7. Solomon teaches that "[i]nvestigation of a large panel of mAbs against various regions of AβP showed that only mAbs targeting the N-terminal regions of the β-peptide exhibit anti-aggregating properties" (Solomon 909, col. 2).

8. Becker teaches that the invention "encompasses pharmaceutical formulations comprising an antibody having a specificity for β-amyloid peptide which is predominantly in a β-sheet conformation in combination with a parenterally-administrable medium" (Becker, col. 2, ll. 5-9).

9. Becker teaches that the "antibodies of the present invention are especially preferred in the diagnosis and/or treatment of Alzheimer's disease in mammals, preferably humans" (Becker, col. 7, ll. 49-52).

10. Becker teaches that the

> Winter technology involves the replacement of complementarity determining regions (CDRs) of a human antibody with the CDRs of a murine monoclonal antibody thereby converting the specificity of the human antibody to the specificity of the murine antibody which was the source of the CDR regions. This "CDR grafting" technology affords a molecule containing minimal murine sequence and thus is less immunogenic.

(Becker, col. 7, ll. 2-10.)

11. Ladner teaches that the "purified single chain binding protein can be utilized by itself, in detectably labelled form in immobilized form, or conjugated to drugs or other appropriate therapeutic agents, in diagnostic, imaging, biosensors, purifications, and therapeutic uses" (Ladner, col. 11, ll. 26-31).

12. Walker teaches that for "all studies, we used monoclonal antibody (MAb) 10D5, a murine IgG_1 kappa light chain (whole IgG and/or Fab fragments) to amino acids 1-16 of Aβ" (Walker 377, col. 2).

13. Walker teaches that "[a]ntibody 10D5 or nonimmune IgG (in sterile saline) was injected directly into the CSF . . . . In the two experimental squirrel monkeys, 450 µg (3 µg/µl) of Fab fragments were injected" (Walker 378, col. 1).

14. Walker teaches that "β-Amyloid in untreated, fresh-frozen tissue sections was robustly labeled by antibody 10D5, whereas normal (non

Aβ -immune) mouse IgG did not bind to native Aβ in this tissue (data not shown). The 10D5 whole IgG and Fab fragments showed comparable immunostaining *in vitro*" (Walker 379, col. 1).

15. Walker teaches that:

> our studies in aged nonhuman primates demonstrate that it is possible to label Aβ selectively *in vivo* by a monoclonal antibody infused into the CSF. It will be necessary to increase the sensitivity of the method and to determine the safety of the procedure before this approach can be assessed for efficacy in a clinical setting. In particular, the specific etiology of the leukocytic reaction to intracisternal injection requires further study. However, *in vivo* labeling has considerable potential for delivering therapeutic agents that could prevent or reverse Aβ deposition in the brains of patients with cerebrovascular amyloidosis or Alzheimer's disease. Furthermore, this strategy eventually might be useful in diagnostic and experimental approaches to β-amyloidogenesis.

(Walker 382, col. 1.)

16. Hanan teaches that "[a]ggregation of β-amyloid was monitored using a commercially available monoclonal antibody, called mAb AMY 33, raised against the peptide 1-28 of β-amyloid (Zymed, San Francisco, CA) and another four monoclonal antibodies called 6C6 and 10D5, raised against peptide 1-28 of β-amyloid" (Hanan 131, col. 1).

17. Bacskai teaches "clearance of amyloid-β deposits after initial treatment of the cortex with direct application of 10D5. . . . These data indicate that clearance of amyloid-β after exposure to 10D5 is a specific response to anti-amyloid-β antibodies rather than a nonspecific response to injury" (Bacskai 371, col. 1).

Principles of Law

The Examiner has the initial burden of establishing a prima facie case obviousness under 35 U.S.C. § 103. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 416 (2007).

Prima facie obviousness can be rebutted by presenting evidence of secondary considerations and when such evidence is submitted, all of the evidence must be considered anew. *In re Piasecki*, 745 F.2d 1468, 1472-1473 (Fed. Cir. 1984). Secondary considerations include: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and praise. *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998); *U.S. Surgical Corp. v. Ethicon, Inc*., 103 F.3d 1554, 1565 (Fed. Cir. 1997).

Analysis

Prima Facie Obviousness – Bickel, Solomon, Becker, and Ladner

Bickel teaches the mouse AMY-33 antibody and teaches that the "specificity of this antibody for β-amyloid protein in neuritic and diffuse plaques and cerebrovascular deposits has previously been demonstrated" (Bickel 122, col. 2; FF 4). Bickel directly suggests humanization of mouse antibodies, such as AMY-33, to "facilitate the use of these proteins as neurodiagnostic or therapeutic agents in humans" (Bickel 124, col. 2; FF 6). Becker similarly teaches humanizing β-amyloid antibodies (FF 8-10). Ladner teaches purifying antibodies for therapeutic uses (FF 11).

The Examiner relies upon the post-filing date Solomon reference to demonstrate that the AMY-33 antibody will inherently satisfy the functional requirements of claim 210 to inhibit β-amyloid aggregation (FF 7). A publication dated after an Appellant's filing date is acceptable as evidence of characteristics of prior art products. *In re Wilson*, 311 F.2d 266, 268-269 (CCPA 1962) ("The board considered that the publication was properly cited to show a state of fact. After reading the entire publication, so do we. It [is] clearly a discussion of the properties of polyurethane foam products generally, products made by the processes of the prior art of record in this case.… As evidence of the characteristics of prior art foam products, however, we know of no reason in law why it is not acceptable.")

We conclude that the combination of Bickel, Becker, Ladner, and Solomon reasonably suggest the use of genetic engineering to humanize the AMY-33 antibody for diagnostic use in detection of β-amyloid (FF 4-11).

Prima Facie Obviousness – Walker, Bacskai, Hanan, and Becker

Walker teaches the use of an unlabeled 10D5 antibody in the pharmaceutically acceptable carrier of sterile saline (FF 12-14). The Examiner does not address whether Walker's 10D5 antibody inherently satisfies the "genetically-engineered" product by process requirement.

Becker teaches humanizing β-amyloid antibodies (FF 8-10). Hanan and Bacskai, both post filing date references, demonstrate that the 10D5 antibody will inherently satisfy the functional requirements of claim 210 to inhibit β-amyloid aggregation (FF 16-17). *Wilson*, 311 F.2d at 268-269.

We conclude that the combination of Walker, Bacskai, Hanan, and Becker reasonably suggest the use of genetic engineering to humanize the

10D5 antibody for diagnostic use in detection of β-amyloid (FF 8-10, 12-17).

Secondary considerations

However, having found a *prima facie* case of obviousness, we must now consider Appellant's evidence of secondary considerations.

Appellant contends that the "unexpected reduction of plaque and/or inhibition of β-amyloid aggregation of the 'naked' antibody, when the only reasonable expectation was the binding or homing of the antibody, would have been **totally surprising** at the time the present invention was made" (Reply Br. 18).

The Examiner finds that "neither the Solomon (2002) reference nor the present disclosure were used to establish obviousness, but merely to evidence that the anti-aggregating property of the instantly claimed antibody is indeed inherent to the prior art AMY-33 antibody" (Ans. 36). The Examiner finds that "the basis of the rejection with respect to the obviousness of genetically engineering the AMY-33 antibody has nothing to do with whether or not it was known at the time of filing that AMY-33 had anti-aggregating properties. Selection of AMY-33 was motivated by other distinct factors altogether" (*id.*). The Examiner makes similar arguments for the 10D5 antibody (*see, e.g.*, Ans. 43-45).

We find that Appellant has the better position. While the discovery of a new property does not render a pre-existing material (i.e., an anticipated material) patentable, that new property may be evidence that a material not previously made, even though *prima facie* obvious, is patentable if the new property was unexpected. The Examiner's position that the "anti-

aggregating" properties of the AMY-33 antibody or 10D5 antibody have nothing to do with the obviousness case is inconsistent with caselaw. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) ("'That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.'")

In this case, the functional attribute of the humanized AMY-33 antibody or 10D5 antibody to have anti-aggregating properties for therapeutic use to treat Alzheimer's disease is an unexpected result which overcomes the prima facie case of obviousness. The Examiner provides no evidence that this result would have been expected.

Conclusion of Law

(i) The evidence of record supports the Examiner's conclusion that Bickel, Solomon, Becker, and Ladner render claim 210 *prima facie* obvious.

(ii) The evidence of record supports the Examiner's conclusion that Walker, Hanan, Bacskai, and Becker render claim 210 *prima facie* obvious.

(iii) Appellant has presented evidence of secondary considerations, that when weighed with the evidence of obviousness, is sufficient to support a conclusion of non-obviousness.

D. 35 U.S.C. § 112, first paragraph, written description

The Examiner finds that the claims are drawn to "a genus of genetically-engineered antibody molecules, including both antibodies and fragments thereof, having a specific functional property, and for which Appellant has only disclosed a single species within the genus" (Ans. 7). The Examiner finds that "there is insufficient guidance and direction for the

genus of antibodies broadly encompassed by the claimed invention" (Ans. 8).

The Examiner finds that

> there is no description in the instant application nor commonly available in the prior art to sufficiently correlate the desired function - that of inhibiting the aggregation of beta-amyloid, maintaining the solubility of soluble beta-amyloid, or recognizing an epitope within residues 1-28 of beta-amyloid - with that of a particular, known structure.

(*Id.* at 10.)

Appellant contends that "[j]ust as applicant was in possession of the entire genus prior to the amendment limiting to the activity of AMY-33 or better, so applicant is in possession of the subgenus which eliminates all those antibodies that have an activity less than that obtainable with AMY-33." (App. Br. 19.)

Appellant contends that the "specification discloses that such selection and comparison is necessary. An example of one antibody within the scope of the claims is given. Antibody technology is still well developed and mature and the further screens are routine" (*id.* at 23).

The issue with respect to this rejection is: Does the evidence of record support the Examiner's conclusion that the disclosure of the Specification failed to demonstrate possession and descriptive support for Claim 210?

Principles of Law

> [T]he hallmark of written description is disclosure…. [T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan

> and show that the inventor actually invented the invention claimed.

Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co., 598 F.3d at 1351.

Analysis

We agree with the Examiner that the Specification does not adequately describe the pharmaceutical composed of either a genetically-engineered antibody or a fragment which "binds beta-amyloid and inhibits aggregation of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33" as broadly claimed.

It is well settled that:

> the inventor cannot lay claim to that subject matter unless he can provide a description of the compound sufficient to distinguish infringing compounds from non-infringing compounds, or infringing methods from non-infringing methods. As the district court observed, "[t]he claimed method depends upon finding a compound that selectively inhibits PGHS-2 activity. Without such a compound, it is impossible to practice the claimed method of treatment."

University of Rochester v. G.D. Searle & Co., 358 F.3d 916, 926 (Fed. Cir. 2004).

Claim 210, as interpreted in light of the Specification, is broadly drawn to any composition of a genetically-engineered antibody and carrier, where the antibody "binds beta-amyloid and inhibits aggregation of beta-amyloid or maintains the solubility of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33." The Specification therefore must adequately describe that genus of compounds.

The written description requirement can be met by disclosing "complete or partial structure, other physical and/or chemical properties, *functional characteristics when coupled with a known or disclosed correlation between function and structure*, or some combination of such characteristics." *Enzo Biochem, Inc. v. Gen-Probe Inc.*, 323 F.3d 956, 964 (Fed. Cir. 2002).

In this case, the Specification has a single working example of an antibody, AMY-33 (*see* FF 2) which is not genetically engineered and therefore is not within the scope of claim 210 (FF 4). In addition, the Specification does not describe any of the specific structural features, physical or chemical properties, or other information which would permit identification of antibodies which would bind beta-amyloid and which would have the functional capacity to maintain solubility as well as the AMY-33 antibody. The claim is entirely functional.

Indeed, while the post-filing date evidence demonstrates that the 10D5 antibody, a known prior art antibody (FF 12), shares the functional requirements of the claim (FF 16-17), the Specification provides no description which would have permitted the ordinary artisan to recognize that the 10D5 antibody satisfied the functional requirements of claim 210.

The present case is therefore analogous to *Rochester* and *Centocor*. In *Rochester*, the patent "describes in detail how to make cells that express either COX-1 or COX-2, but not both …, as well as 'assays for screening compounds, including peptides, polynucleotides, and small organic molecules to identify those that inhibit the expression or activity of the PGHS-2 gene product.'" *Rochester*, 358 F.3d at 927.

Rochester held that even if a DNA sequence might support a claim to hybridizing nucleic acids, the "same is not necessarily true in the chemical arts more generally. Even with the three-dimensional structures of enzymes such as COX-1 and COX-2 in hand, it may even now not be within the ordinary skill in the art to predict what compounds might bind to and inhibit them." *Rochester*, 358 F.3d at 925.

Thus, in *Rochester*, the court found unpersuasive the instant argument by Appellant that "[a]ntibody technology is still well developed and mature and the further screens are routine" (App. Br. 23). The court found that the ordinary artisan could not predict which compounds might satisfy the functional requirements of the claim, the same situation which applies in the instant fact pattern.

Appellant also relies upon the USPTO written description guidelines, and in particular, Example 13, drawn to support for a "claim drawn to 'an isolated antibody capable of binding to antigen X'" (*see* App. Br. 20). Appellant also relies upon two Board decisions (*see* Reply Br. 11-15). We find that the decision of the Federal Circuit in *Centocor* is more closely related than these other Board decisions.

In *Centocor*, the Court addressed Example 13 of the USPTO written description guidelines. The Court found that the "PTO guidelines conclude that characterization of the protein alone may be sufficient under circumstances where 'one of skill in the art would have recognized that the disclosure of the adequately described [protein] X put the applicant in possession of antibodies which bind to [protein] X.'" *Centocor Ortho Biotech, Inc. v. Abbott Laboratories*, 636 F.3d 1341, 1351 (Fed. Cir. 2011).

Centocor distinguished the USPTO written description guideline situation, where the claim simply required binding an antigen, from the more complicated situation where specific properties beyond simply binding of antigen by the antibody are required. *Id.* at 1352. *Centocor* found that "[c]laiming antibodies with specific properties, e.g., an antibody that binds to human TNF-α with A2 specificity, can result in a claim that does not meet written description even if the human TNF-α protein is disclosed because antibodies with those properties have not been adequately described." *Id.*

The instant situation is virtually identical to the *Centocor* situation, since in both cases the antigen of interest was known, but there was no description in the Specification or prior art of the specific properties required. In the instant case, there was no description of any "genetically-engineered" antibodies which "binds beta-amyloid and inhibits aggregation of beta-amyloid or maintains the solubility of soluble beta-amyloid to an extent at least as great as that obtainable with antibody AMY-33." Even AMY-33 itself is a mouse monoclonal antibody, and was not genetically engineered, and so is not within the scope of the instant claims (FF 4).

As *Ariad* points out, the "written description requirement also ensures that when a patent claims a genus by its function or result, the specification recites sufficient materials to accomplish that function—a problem that is particularly acute in the biological arts." *Ariad*, 598 F.3d at 1352-53. That is the central issue here, where at best a single species of antibody which satisfies the functional requirements of claim 210 is disclosed. We conclude that Appellant's claims "merely recite a description of the problem to be solved while claiming all solutions to it and … cover any compound later

actually invented and determined to fall within the claim's functional boundaries— leaving it to the pharmaceutical industry to complete an unfinished invention." *Ariad*, 598 F.3d at 1353.

Conclusion of Law

The evidence of record support the Examiner's conclusion that the disclosure of the Specification failed to demonstrate possession and descriptive support for Claim 210.

SUMMARY

In summary, we reverse the rejection of claims 177 and 210-218 under 35 U.S.C. § 112, first paragraph, new matter.

We reverse the rejection of claims 177, 210-213, and 215-217 under 35 U.S.C. § 103(a) as obvious over Bickel, Solomon, Becker, and Ladner.

We reverse the rejection of claims 177, 210-213, 215-217, 219-223, and 225-227 under 35 U.S.C. § 103(a) as obvious over Walker, Hanan, Bacskai, and Becker.

We affirm the rejection of claims 177 and 210-218 under 35 U.S.C. § 112, first paragraph, as failing to satisfy the written description requirement.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

cdc